Modeling to Evaluate Fate and Transport of Sediment-Bound Contaminants at Hunters Point Shipyard, California







Hunters Point Shipyard, San Francisco

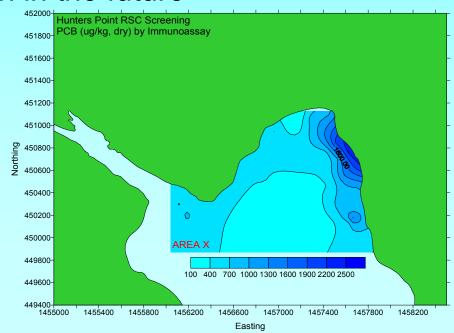


HPS Sediment Dynamics Study Objectives

- Characterize fate and transport of sediment-bound contaminants
- Estimate sediment accumulation rates
- Predict likelihood of subsurface sediment remobilization under various conditions including extreme events
- Data will support feasibility study, including evaluation of monitored natural recovery

South Basin: Monitored Natural Recovery?

- Steep chemical concentration gradient; potentially large offshore area with relatively lower concentrations
- Higher chemical concentrations at depth
- South Basin not likely to be subject to dredging or construction in the future

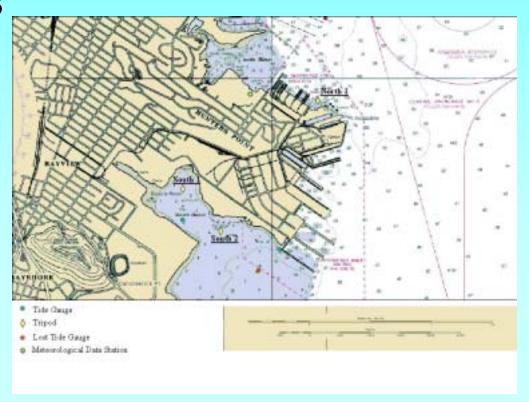


HPS Sediment Dynamics Study Overview

- Initial evaluation using readily available data suggested that average wave conditions in shallow areas would cause resuspension
- Site-specific measurements of waves, currents and suspended sediment concentrations for one tidal cycle in winter and summer
- Predictive sediment transport modeling
- Radioisotope profiles of cores (²¹⁰Pb and ¹³⁷Cs)

HPS Sediment Transport Measurements

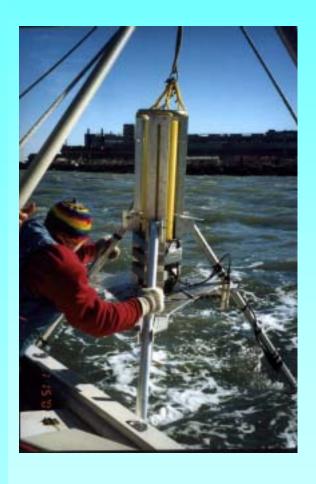
Time-series measurements of waves, currents and suspended sediment concentrations for one tidal cycle in winter (Jan-Feb 2001) and summer (July 2001) at three stations



Sediment Transport Measurement System (STMS)



STMS Deployment



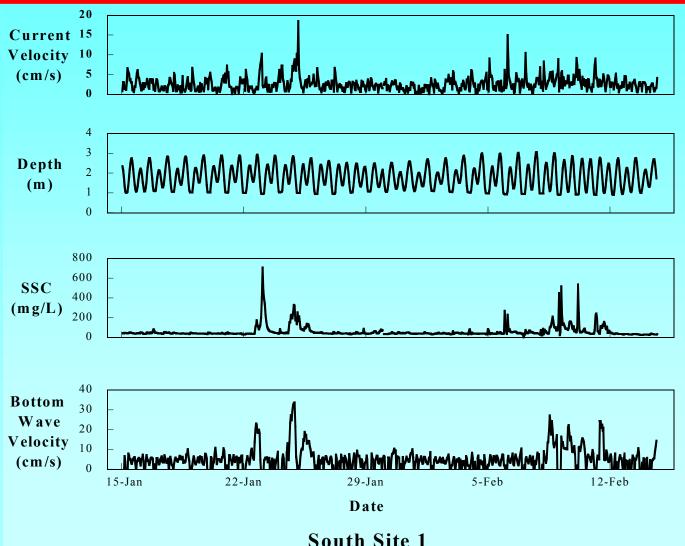


Deployed STMS at Station South 1

SEDIMENT
WORK GROUP

Deployment from 25' vessel

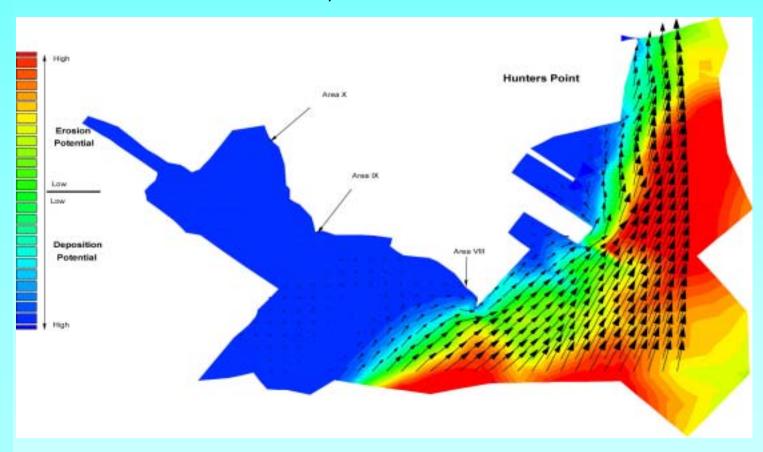
STMS Data for Station South 1, Winter 2001



South Site 1

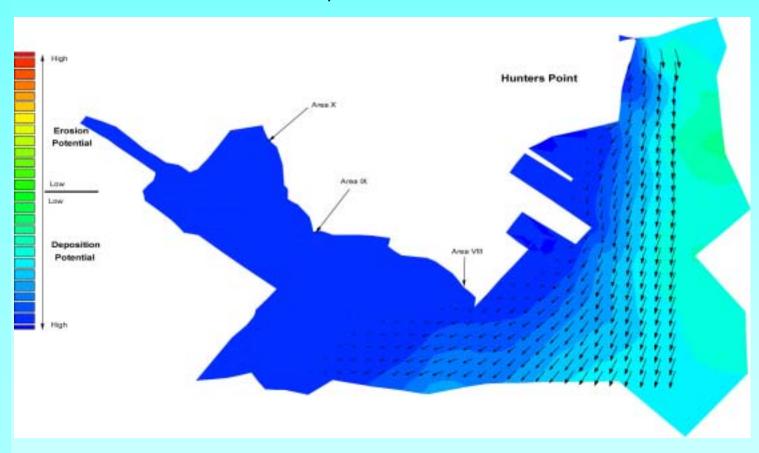
Regional (2-D) Sediment Transport Modeling

Ebb Tide, Winter 2001



Regional Sediment Transport Modeling (cont.)

Flood Tide, Winter 2001



Characterizing Sediment Dynamics: Challenges and Uncertainties

- Ensuring adequate representation of site conditions
- To mark or not to mark stations?
- Biofouling
- Difficulties modeling behavior of fine-grained cohesive sediment in nearshore environments

Conclusions

- Sediment dynamics studies at HPS will provide better data for evaluating viability of natural recovery
- Site-specific data are critical because of uncertainty in sediment transport models
- Future efforts at HPS will focus on potential impact of extreme events and defining depth at which sediments might be considered "permanently buried"